School of Engineering and Technology

Department of Mechanical and Automobile Engineering

Curriculum Feedback Analysis 2021-22

The Department of Mechanical and Automobile Engineering revises its curriculum for the programmes offered every year based on the relevant trends in industry and emerging technologies by considering the feedback provided by all its stakeholders on the curriculum. This report is an analysis of the feedback collected from the various stakeholders like students, alumni and faculty members and this report shall be forwarded to the Department Curriculum Design and Development Cell (CDC) for consideration while revising the curriculum.

This academic year feedback was collected from a total of 98 students, 25 faculty members, 47 alumni, 13 employers and parents. This feedback was analyzed and this report contains the analysis and recommendations to CDC based on the analysis carried out.

Students Feedback on Curriculum

A total of 98 students took the curriculum feedback survey. The questionnaire and the number of responses for each year of study was as follows

| Total Number Students Participated in the Survey : 98					
EVALUATION PARAMETERS	**Excellent**	**Good**	**Satisfactory**	**Average**	**Needs to improve**
Does the content of the syllabus satisfy the stated objectives and learning outcomes?	37	46	11	2	2
Does the syllabus cover advanced topics?	34	47	12	3	2
Whether the syllabus enhance the knowledge and skill in relevant domain?	39	44	8	4	3
Is the syllabus effective in developing critical and analytic thinking?	35	44	16	3	0
Are the textbooks and reference materials relevant to the content of syllabus?	38	43	12	5	0
Does the syllabus orient towards higher education?	38	44	16	0	0
Does the syllabus enable the students to apply their knowledge in real life situations?	40	40	15	3	0
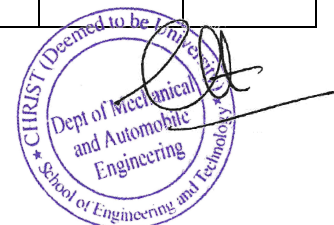
Is employability given weightage in the design and development of syllabus?	35	45	14	3	1
Does the syllabus promote self-study and attitude of research?	35	48	12	1	2
Does the syllabus meet overall expectation?	38	41	15	3	1
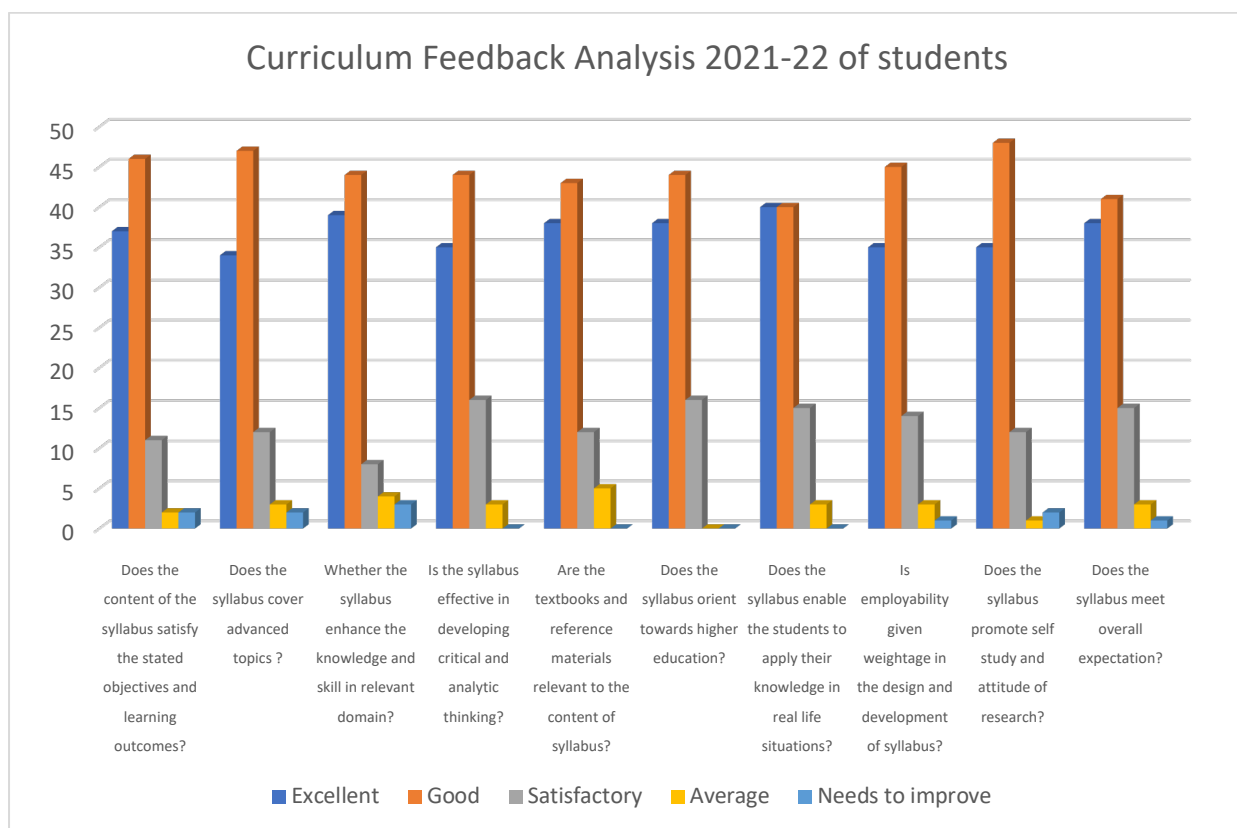
The above graph is a representation of the feedback responses given by the students as per the questionnaire. The graph given below depicts the overall expectation meeting of the students from all years as far as syllabus is concerned. From the graph it can be seen that the students have given a feedback where 90% of the students are satisfied with the curriculum being offered. However, when the general comments and suggestions were analyzed, the following were the main points given by the students.

In the curriculum of B.Tech in Mechanical Engineering, B.Tech in Automobile Engineering, B.Tech Robotics and Mechatronics and M.Tech in Machine Design, no major concerns were present based on the feedback. The major suggestion given by the students as follows.

- Inclusion of trending areas like Python, Artificial-Intelligence and Machine-Learning in the course.
- Students to be encouraged to opt for online courses offered by reputed sources.
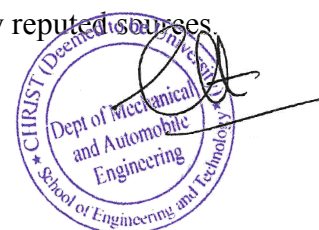
Faculty Feedback on Curriculum

Faculty members are the backbone of any higher education institution and their feedback is very important to analyse the curriculum and to update it as per the necessity. As a practice, the department takes feedback from every course handling faculty member and the below section is an analysis of the same. The questionnaire floated with 23 faculty members concentrated on the below questions and also on suggestions/ recommendations for the courses handled by them in the even semester of 2020- 21 and odd semester of 2021-22. The synopsis of the same is given below.

Total Number of Faculties Participated in the Survey :25					
EVALUATION PARAMETERS	**Excellent**	**Good**	**Satisfactory**	**Average**	**Needs to improve**
Does the syllabus satisfy the stated objectives and learning outcomes?	8	15	1	0	1
Do you have continuous processes to propose, modify, suggest and incorporate new topics in the syllabus?	13	11	1	0	0
Is the syllabus effective in developing independent thinking?	8	13	3	1	0
Does the departmental level expert committee meet to review the syllabus?	15	8	2	0	0
Does the syllabus enhance your knowledge in the subject area?	10	13	2	0	0
Does the syllabus enable the students to apply their knowledge in real life?	11	12	2	0	0
Does the syllabus demand the teachers for research inclusive teaching?	8	11	5	1	0
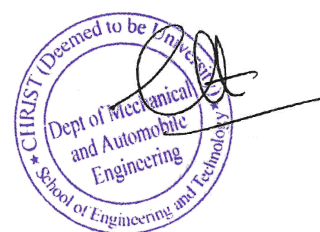
Curriculum Feedback Analysis 2021-22 of Faculties
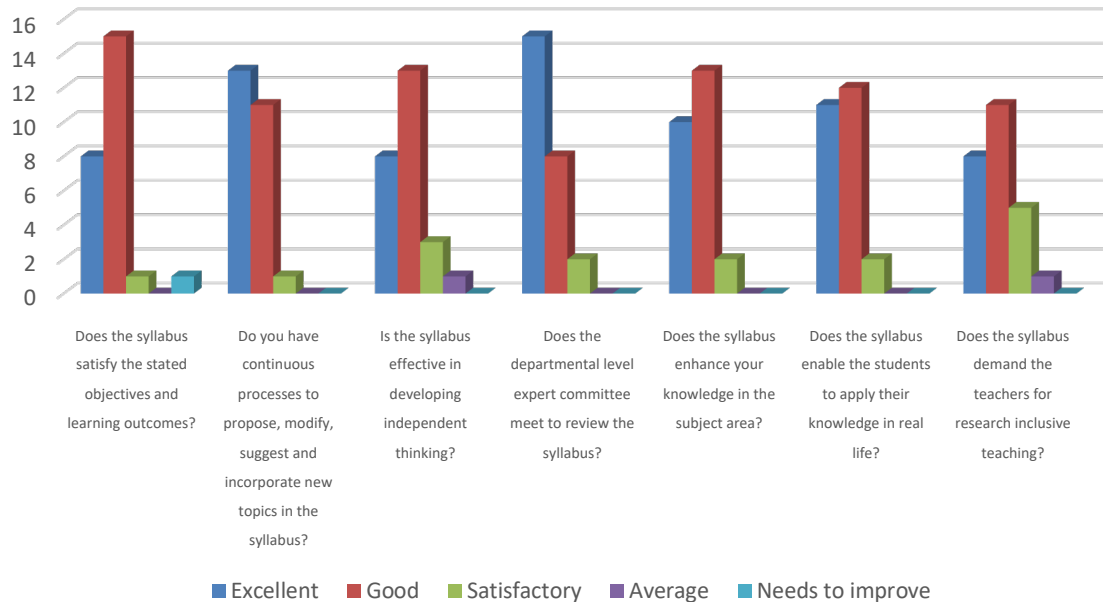
The major suggestion given by the students as follows.

- Modify/Revisit course outcome for all the courses
- Industry oriented topics to be introduced in the curriculum

**Feedback from Alumni, Parents and External Experts**

Feedback from Alumni, Industry experts, parents along with faculties and students is most important to improve the curriculum for ensuring an education that is outcome based for betterment of students as well as meet the expectations of our stakeholders. We thankful to our stakeholder to give their time and valuable feedback.
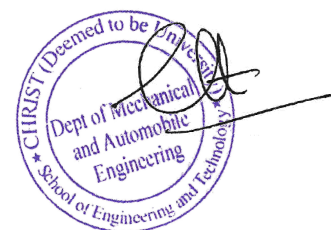
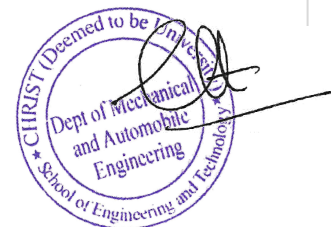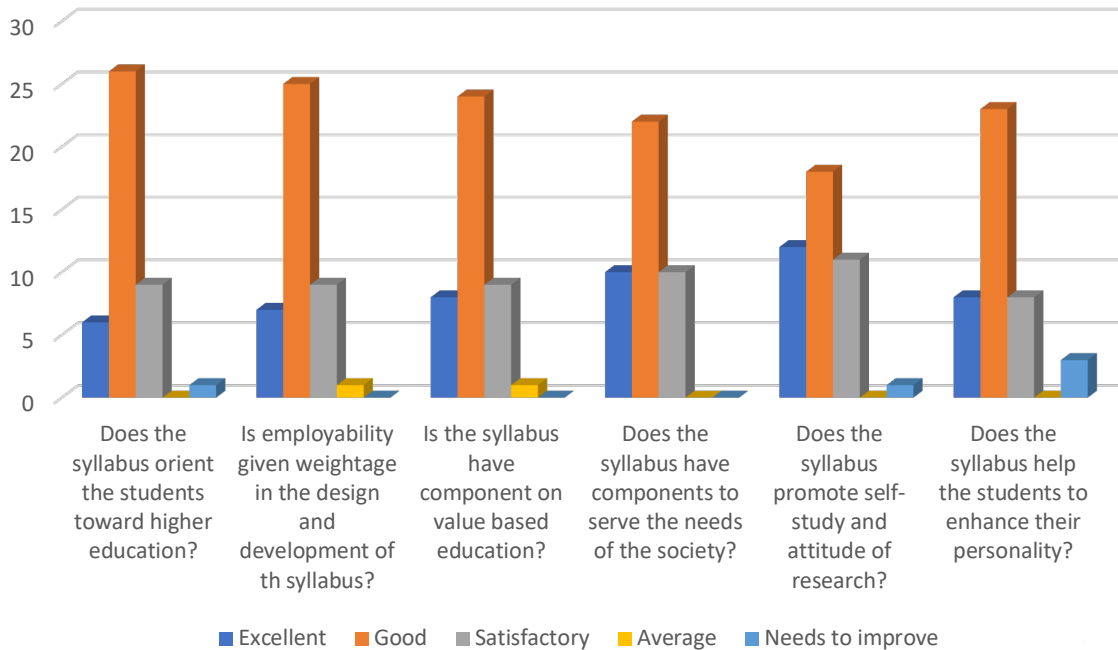| EVALUATION PARAMETERS	Excellent	Good	Satisfactory	Average	Needs to improve
Total Number of Alumni Participated in the Survey : 51					
Is the syllabus updated on a regular basis depending on the current trends and advanced topics?	19	19	6	7	0
Does the syllabus orient towards higher education?	12	20	11	5	3
Does the syllabus provide employabillity weightage?	11	13	11	11	5
Does the syllabus meet the expectations of the industry?	12	17	9	10	3
Does the syllabus enable the students to connect the knowledge to real life application?	9	19	14	8	1
Does the syllabus encourage entrepreneurship?	11	15	16	7	2
Do you think that the syllabus motivates the students for research and development?	17	15	11	8	0

Curriculum Feedback Analysis 2021-22 of Alumni
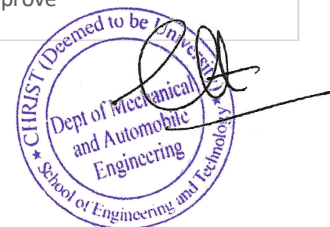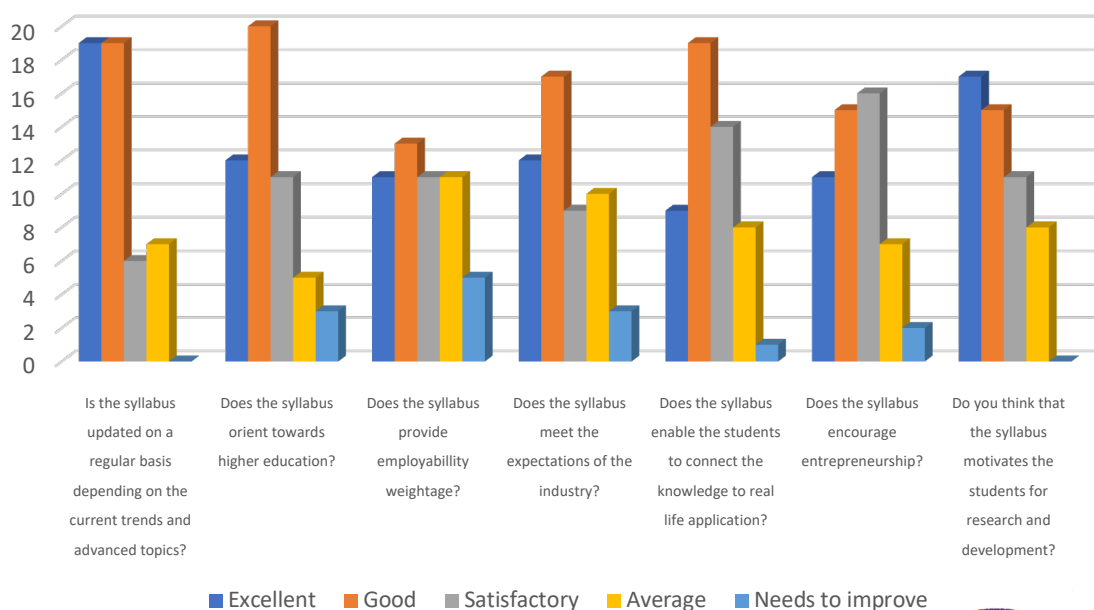
| Total Number of Parents Participated in the Survey: 42					
EVALUATION PARAMETERS	Excellent	Good	Satisfactory	Average	Needs to improve
Does the syllabus orient the students toward higher education?	6	26	9	0	1
Is employability given weightage in the design and development of the syllabus?	7	25	9	1	0
Is the syllabus have component on value based education?	8	24	9	1	0
Does the syllabus have components to serve the needs of the society?	10	22	10	0	0
Does the syllabus promote self-study and attitude of research?	12	18	11	0	1
Does the syllabus help the students to enhance their personality?	8	23	8	0	3

Curriculum Feedback Analysis 2021-22 of Parents

Total Number of External Experts Participated in the Survey: 13					
EVALUATION PARAMETERS	Excellent	Good	Satisfactory	Average	Needs to improve
Is the syllabus aligned with the objective of the program?	9	4	0	0	0
Does the syllabus cover advanced topics and current trends?	11	1	1	0	0
How would you rate the relevance of the electives offered in the syllabus?	9	3	0	0	1
Is employability given weightage in the design and development of the syllabus?	7	5	1	0	0
Does the syllabus meet the expectation of the industry?	9	4	0	0	0
Does the syllabus cater to enhancement of skills of the students with respect to the industry needs?	8	5	0	0	0

Curriculum Feedback Analysis 2021-22 of External Experts
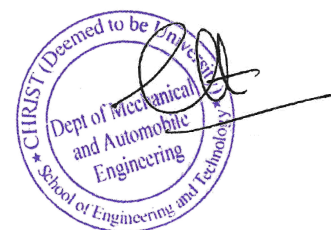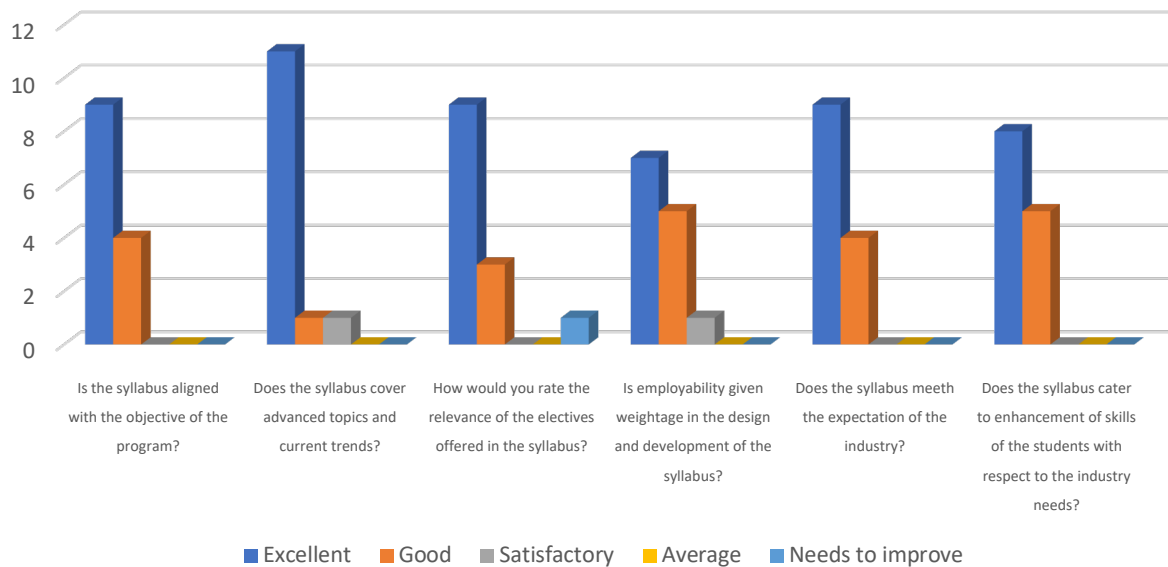
In addition to the above feedback collected from faculty members, feedbacks were also collected from alumni, employers and parents. The major suggestions as given by these stakeholders are as follows
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- Placement opportunities in the core mechanical engineering companies and curriculum to focus on industry oriented courses and training.
- More individual and group activities need to be added in the curriculum.
- Subjects like Python, Machine Learning and AI for Mechanical Engineers can be introduced. These IT skills are becoming mandatory even for Mechanical Engineers

This analysis report on all the feedbacks collected from the students, faculty members, alumni and verticals shall be presented to the Department CDC for discussion and deliberation to be recommended to the Department Board of Studies for the academic year 2022-23 to be held in the month of January/February 2022.
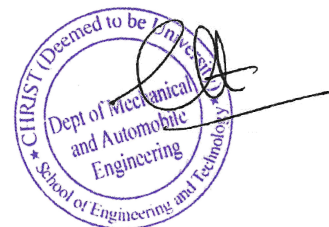
School of Engineering and Technology

Department of Mechanical and Automobile Engineering

Action Taken Report on Curriculum Feedback Analysis 2021-22

The Department of Mechanical and Automobile Engineering collects analyses and takes action based on the feedback received from all the stakeholders as far as curriculum is concerned. The stakeholders from whom the feedback is collected are

1. Students

2. Teachers

3. Alumni

4. Parents

5. Industry Experts

The Curriculum Design and Development Cell (CDC) of the Department initiates this feedback collection, also analyses the same, and prepares a feedback analysis report on the curriculum every academic year. These are then proposed to the Department Board of Studies (BoS) for their approval to be included in the curriculum for the subsequent academic year. This report highlights the action taken in the below mentioned courses which have been revised as per the feedbacks received from the stakeholders.

School: School of Engineering and Technology
Discipline/Subject: Mechanical and Automobile Engineering
Programme**: B.Tech-Mechanical Engineering**

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
ME333P- Strength of Materials	Unit-2-Chapter2: Theory of bending stresses Unit-3: Theory of bending stresses	Unit-2-Chapter2: Deflection of Beams Unit-3: Theory of bending stresses Activity: Determination of Neutral axis for any regular or composite beam section using MATLAB or Excel	Swapping of chapter topics of Unit 2 with Unit 3 to balance the teaching hours per unit as well as to introduce software exercises in Unit 3 Current Market era requires programming skill for the students. Hence, simple module to solve the problems with the help of commercial tool can be used here.	Chapter on Deflection of Beams is taken to Unit 2 to balance of teaching hrs	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Elective Course	Nil	ME544E8/Basic Concepts of Mechatronics	Introducing Mechatronics for Mechanical Engg Students	Based on Feedback on curriculum	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Elective Course	Nil	ME644E8/Embedded System Design	Introducing Mechatronics for Mechanical Engg Students	based on Feedback on curriculum	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
ME644E10/Fuel Cells for Automotive Applications	Nil	New Elective Course	Introducing a course on emerging area as an elective	based on Feedback on curriculum	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Elective Course	Nil	ME741E8/ Under Water Robotics	Introducing a course on emerging area as an elective	Based on Feedback on curriculum	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Elective Course	Nil	ME741E9/Data Communication Networking	To introduce AI/ML courses to Mechanical Engineering Programme	Based on Feedback on curriculum	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Elective Course	Nil	ME742E8/ Machine Learning Using Python Programming	To introduce AI/ML courses to Mechanical Engineering Programme	Based on Feedback on curriculum	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Elective Course	Nil	ME841E8/Artificial Intelligence for Mechatronics Systems	To introduce AI/ML courses to Mechanical Engineering Programme	Based on Feedback on curriculum	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Elective Course	Nil	ME841E9/Operations Research	Change is made as per AICTE guidelines Moving core course of VIII sem as Elective in VII sem	Based on Feedback on curriculum	All
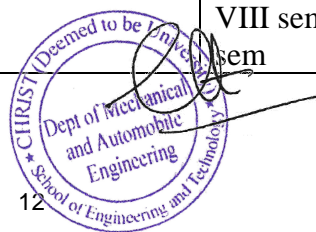
School: School of Engineering and Technology
Discipline/Subject: Mechanical and Automobile Engineering
Programme: B.Tech-**Automobile Engineering**

Details of Changes

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
AU431-Automotive Transmission	**Unit 1**: Role of Clutch in driving system - Requirements of transmission system – Design aspects - Construction and working principle of different types of clutches - Designing the torque capacity, axial force of single plate clutch and typical problems involving the above principles **Unit 3**: Multi-stage hydro-kinetic torque converter - Poly-phase hydro-kinetic torque converter - Construction, working and performance	**Unit 1:Clutch:** Necessity of clutch in an automobile, different types of clutches, Clutch - adjustment, Clutch troubles and their causes, requirements of a clutch , Clutch materials, clutch lining, Vacuum operated clutch, Numerical problem **UNIT 3:** **New topics Introduced** Fluid Coupling and Torque Converter:, necessity and field of application, Fluid coupling characteristics, constructional details of	**Unit 3** is added with coupling converter and **Unit 4** is introduced with drives including that for Hybrid Vehicles. Changes are made to streamline the contents into different Units	Unit 3 is added with coupling converter & Unit 4 is revamped	All

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	Unit 4: Principle of working of epi-cyclic gear train - Construction and working principle of Ford-T model gear box - Wilson gear box-construction, working and derivation of gear ratios - Cotal electromagnetic transmission - Automatic over-drive - Hydraulic control system for automatic transmission. Chevrolet automatic transmission	various types, percentage slip. **Unit 4:Drive Line and Differential:** Chain drive, propeller shaft drive, torque reaction and drive thrust, Hotchkiss drive, Torque tube drive, universal joints, front wheel drive, different types of final drive, double reduction and twin speed final drives, differential, construction details , non-slip differential, differential locks, rear axle assembly, types, multi axle vehicles, power train for hybrid vehicles			

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
AU432P/ Automotive Material and Manufacturing Technology	Unit5: Special processing techniques-Hydroforming-stretch forming-Recent developments in auto body panel forming-squeeze casting of pistons, Aluminium composite brake rotors-sinter diffusion bonded idler sprocket-Gas injection moulding of window channel-Cast con process for auto parts-computer modelling and simulation-material characteristics and failure analysis. Unit4: Engine Material and Manufacturing	Unit5: Types of batteries, Battery chemistry of Lead acid, Nickel Cadmium Batteries, Lithium Batteries, Lithium Polymer Battery, The Lithium Ion Battery, Metal–Air Batteries (Aluminium–Air Battery). Battery terminologies, Battery pack materials Unit4: Composites in Automotive Environment	New topic on battery materials is included in unit-5 Unit-3 Covers the major portion of unit-4, hence replaced with new topics		All

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| Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
AU531/Design of Automotive Components	UNIT 1: Engineering materials - Introduction endurance limit, notch sensitivity. Tolerances, types of tolerances and fits, design considerations for interference fits, surface finish, surface roughness, Rankine's formula - Tetmajer's formula – Johnson formula- design of pushrods. Unit 5: Crankshaft: Balancing of I.C. engines, MI of Crankshaft, significance of firing order. Material for crankshaft, design of crankshaft under bending and twisting, balancing weight calculations, development of short and long crank arms. Front and rear-end details. Springs: Types of springs - stresses in Helical coil springs of circular and non-circular cross sections. Tension and compression springs, springs under fluctuating loads, Leaf Springs: Stresses in leaf	UNIT 1: Introduction: Stress, strain, ductile and brittle materials. Static Strength: Static load, Stresses, Factor of Safety, Theories of Failure, Stress Concentration. Impact Strength: Load, Stress, Effect of Inertia, Resilience and Toughness UNIT 5: Riveted and Welded Joints: Types, rivet materials, Failures of riveted joints, Joint Efficiency, Boiler Joints, Riveted Brackets. Types of welded joints, Strength of butt and fillet welds, eccentrically loaded welded joints Springs: Types of springs - stresses in Helical coil springs of circular and non-circular cross sections.	The contents were repetitions, covered in the course Kinematic of Machines. The added contents are essential fundamentals to study the Design of components. Unit 5, Crankshaft content from the previous syllabus is been replaced by riveted and welded joints as the Design procedure of crankshaft is already covered.	Repetition of contents are avoided	All

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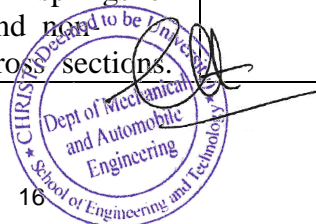
	springs. Equalized stresses and Energy stored in springs.	Tension and compression springs, springs under fluctuating loads			

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
AU632/Automotive Chassis and Vehicle Body Engineering and Safety	Title: Automotive chassis and Vehicle Body Engineering and Safety	Title: Automotive Chassis and Suspension	In Earlier BOS, 2 courses namely Automotive Chassis and Vehicle Body Engineering and Safety were merged as one course. Students will find it difficult to manage based on vast contents, hence, the title is changed and removed the contents of vehicle body Engineering and safety. Vehicle body Engg and safety(AU741E6) is been given as a separate subject in programme Elective 3 basket which is in 7th semester	Students feedback	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Course	Nil	AU544E6/Fuel Cells For Automotive Applications	Suggestion from stake holders	Suggestion from stake holders	All

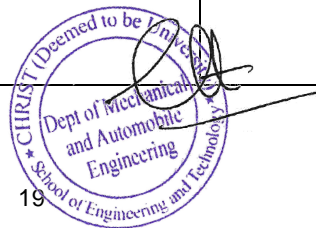| Details of Changes					
Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
New Course	Nil	AU741E6/ Vehicle body Engineering and safety	Course teacher suggestion based on student feedback stake holders	Suggestion from stake holders	All
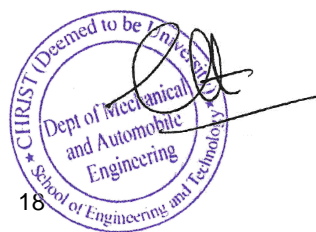
School: School of Engineering and Technology
Discipline/Subject: Mechanical and Automobile Engineering
Programme: B.Tech-**Robotics and Mechatronics**

Details of Changes					
Existing Code and Course	**Existing Details**	**Proposed Change**	**Reasons for Change**	**Remarks**	**Applicable to Batch**
RM334/Manufacturing Technology	Manufacturing Technology	Manufacturing and Industrial Robotics	Students needs to have basic knowledge of industrial robotics and automation before studying other theory papers in higher semesters	New Course replaced instead of manufacturing Technology	All

Details of Changes					
Existing Code and Course	**Existing Details**	**Proposed Change**	**Reasons for Change**	**Remarks**	**Applicable to Batch**
RM351 Basic Mechatronics Lab	Basic Mechatronics Lab	Basic Robotics and Mechatronics Lab	Robotics is added to Basic mechatronics lab	Subject renamed	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM431P Embedded System Design	Embedded System Design	Embedded Systems	Subjects combined because repetitive topics	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM351 Basic Mechatronics Lab	Basic Mechatronics Lab	Basic Robotics and Mechatronics Lab	Robotics is added to Basic mechatronics lab	Subject renamed	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM431P Embedded System Design	Embedded System Design	Embedded Systems	Subjects combined because repetitive topics	New course	All

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Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM434P Microcontroller and Applications	Microcontroller and Applications	Fundamentals of Python Programming	Students needs to have basic knowledge on Python programming so that they can apply it for mini projects or for any theory papers.	New Course replaced instead of Microcontroller and applications	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM531P Data Acquisition System	Data Acquisition System	Data Acquisition and Vision system in robotics	Instead of two theory paper Data acquisition system and Robot and Vision system. Repetitive contents of two theory papers, so combined	Renamed the title	All

Details of Changes

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM631P CNC Technology	CNC Technology	Digital Manufacturing	New topics on MEMS, rapid prototyping instead of CNC Technology is added, hence subject title is renamed	Renamed the title	All

Details of Changes

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM632 Artificial Intelligence for Mechatronics Systems	Artificial Intelligence for Mechatronics Systems	Artificial Intelligence and Machine Learning	Added topics on machine learning to gain the knowledge on ML along with AI	Renamed the title	All

Details of Changes

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM633 Robotics and Vision System	Robotics and Vision System	Field and Service robots	As topics are repeating from previous semester course is replaced	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM651 Robotics Lab	Robotics Lab	AI and Machine Learning Lab	As topics are repeating from previous semester course is replaced	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM751 Embedded System Lab	Embedded System Lab	Automotive System Design Laboratory	As topics are repeating from previous semester course is replaced	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM534E1 Automotive Engineering	Automotive Engineering	Autonomous Vehicles	New topics on autonomous vehicles is added to the topic and the course name is replaced	New course	All

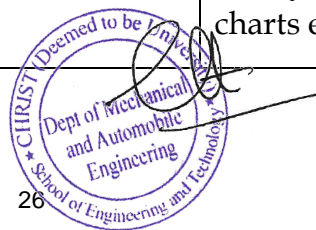| Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM741E2 Machine Learning Using Python Programming	Machine Learning Using Python Programming	Smart Sensors for IoT Applications	As topics are repeating from previous semester course is replaced	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM741E4 Industrial Automation	Industrial Automation	Optimization Techniques	As topics are repeating from previous semester course is replaced	New course	All

Details of Changes

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM741E5 Embedded System Design	Embedded System Design	Computer Aided Manufacturing	As topics are repeating from previous semester course is replaced	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM742E3 Industrial Engineering	Industrial Engineering	Industrial Engineering and Management	Instead of Industrial Engineering -some management related paper should be included as it will help students for higher studies as well as placement and real life applications	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM842E1 Sensors and Actuators	Sensors and Actuators	Industrial Design	Repeat of subject Sensors and Actuators Also help students to design or modelling of robots with ergonomic aspects	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM842E3 Computer Integrated Manufacturing	Computer Integrated Manufacturing	Metrology and Quality Control	Instead of Computer Integrated Manufacturing (included in digital manufacturing subjects) With metrology subject students can learn measurement and inspection aspects Also quality control will help students to learn Taguchi method, 6σ theory, distribution charts etc.	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM842E5 Total Quality Management	Total Quality Management	**Process Planning and Cost Estimation**	Instead of Total Quality Management -Helps students to learn about assembly line in industries, process planning with respect to robotics From cost estimation, they can learn for budget calculation for project or in industrial aspects	New course	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM332P/Solid and Fluid Mechanics	Title: Solid and Fluid Mechanics	Title: Analog and Digital Electronics	Analog and Digital Electronics moved to 3rd sem as a prerequisite for the 4th sem subject Embedded and Microcontroller	Subjects are swapped b/w 3rd and 4th sem	All

Existing Code and Course	Existing Details	Proposed Change	Reasons for Change	Remarks	Applicable to Batch
RM432P/ Analog and Digital Electronics	Title: Analog and Digital Electronics	Title: Solid and Fluid Mechanics	Analog and Digital Electronics moved to 3rd sem as a prerequisite for the 4th sem subject Embedded and Microcontroller	Subjects are swapped b/w 3rd and 4th sem	All

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